

Fisheries Review



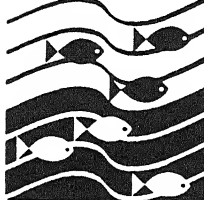
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Fisheries Review is intended to furnish fishery biologists with abstracts of current literature in sport fishery research and management.

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[Zool. Inst., Univ. Hamburg, Martin-Luther-King-Platz 3, D-2000 Hamburg 1 West Germany]

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[Dep. Fish. Oceans, P.O. Box 5667, St. John's, NF A1G 5X1, Canada] We tested the hypothesis that anadromous salmonids are guided on their homeward migration by population-specific pheromones. Our findings do not support the hypothesis. Wild migrant Arctic charr, *Salvelinus alpinus*, from Ikarut River, Labrador were transferred and held in a tributary previously uninhabited by anadromous fish. None of the charr migrating up Ikarut River entered the tributary after fish were transferred. Similarly, migrant charr, which we caught in Ikarut River and released in the tributary below the captive fish, did not remain in the tributary. We re-evaluated the data which have been used to uphold the concept of pheromone attraction in salmonid migration and concluded that support for the hypothesis is unsubstantiated.

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86-001561 Johnson, J. H. and P. A. Kucera. SUMMER-AUTUMN HABITAT UTILIZATION OF SUBYEARLING STEELHEAD TROUT IN TRIBUTARIES IN CLEARWATER RIVER, IDAHO. *Can. J. Zool.* 63(10):2283-2290. 1985. In English with French summ. FR 31(2)

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86-001563 Jones, K. A. and T. J. Hara. BEHAVIOURAL RESPONSES OF FISHES TO CHEMICAL CUES: RESULTS FROM A NEW BIOASSAY. *J. Fish Biol.* 27(4):495-504. 1985. FR 31(2)

[Berkley and Co., Inc., Trilene Dr., Spirit Lake, IA 51360]

86-001564 Kanehiro, H.; M. Suzuki and K. Matuda. [CHARACTERISTICS OF SCHOOLING BEHAVIOR BY THE GROUP SIZE OF ROSE BITTERLING IN THE EXPERIMENTAL WATER TANK.] *Bull. Jpn. Soc. Sci. Fish.* 51(12):1977-1982. 1985. In Japanese with English summ. FR 31(2)

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[Dep. Oceanogr., Univ. Hawaii at Manoa, Honolulu, HI 96822] Tagged individuals of the Eastern Pacific sharpnose puffer, *Canthigaster punctatissima*, were studied at Punta Santa Inez, Baja California Sur. Territories were maintained by both sexes in this sexually dimorphic fish. Male puffers appear to have harems; one large male interacts with one to four smaller females. Puffers from different harems were not seen to interact except for occasional aggressive contact. Removal of a male puffer resulted in the overnight takeover of his harem by a neighboring male. Harem-forming behavior is discussed, as well as the possible role of predation.

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[Me. Coop. Fish. Res. Unit, Dep. Zool., Univ. Me., Orono 04469]

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[A. N. Severtsov Inst. Evol. Morphol. Anim. Ecol., Acad. Sci. USSR, Moscow USSR]

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[Sch. Fish., WH-10, Univ. Wash., Seattle 98195] To test the hypothesis that population-specific pheromones guide adult salmonids to their natal streams, juvenile and adult coho salmon (*Oncorhynchus kisutch*) were tested for chemosensory responses in two-choice tanks. Coho salmon from Quinsam and Bulkley Qualicum rivers, British Columbia, Canada, distinguished their own population from the other. Tagging evidence indicates that straying between these two rivers and a third, geographically intermediate river seldom occurs. Thus, population-specific chemicals constitute a potential source of information for homing coho salmon, though their role vis-à-vis imprinted odors from other sources could not be evaluated.

86-001571 Rose, G. A. GROWTH DECLINE IN SUBYEARLING BROOK TROUT (*SALVELINUS FONTINALIS*) AFTER EMERGENCE OF RAINBOW TROUT (*SALMO GAIRDNERI*). *Can. J. Fish. Aquatic Sci.* 43(1):187-193. 1986. FR 31(2)

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[Dep. Biol., Univ. Saskatchewan, Saskatoon, SK S7N 0W0, Canada]

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[Sch. For. Resour., Pa. State Univ., University Park 16802]

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[Fysiol. I, Med. Fac., Erasmus Univ., Dr. Molenwaterplein 50, Rotterdam, Netherlands]

86-001580 Wyers, E. J. COGNITIVE-BEHAVIOR AND STICKLEBACKS. *Behaviour* 95(1-2):1-10. 1985. FR 31(2)

[State Univ. N.Y., Stony Brook, NY 11794]

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[Danish Inst. Fish. Mar. Res., Charlottenlund Castle, DK-2920 Charlottenlund, Denmark]

FISHERIES REVIEW

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86-001582 Creed, R. P., Jr. FEEDING, DIET, AND REPEAT SPAWNING OF BLUEBACK HERRING, *ALOSA AESTIVALIS*, FROM THE CHOWAN RIVER, NORTH CAROLINA. *NOAA Fish. Bull.* 83(4):711-716. 1985. FR 31(2)

[Dep. Zool., Mich. State Univ., East Lansing 48824]

86-001583 Ebert, D. A. BIOLOGICAL ASPECTS OF THE SIXGILL SHARK, *HEXANCHUS GRISEUS*. *Copeia* 1986(1):131-135. 1986. FR 31(2)

[Moss Landing Mar. Lab., P.O. Box 450, Moss Landing, CA 95039] Life history information on 28 sixgill sharks, collected off California, was obtained from May 1982 through Sept. 1984. Only one mature sixgill shark, a 421 cm TL female with term embryos, was examined. Size at maturity was estimated for females by comparing gonad development with length-weight measurements. Gut analysis revealed that the sixgill shark's diet consists mainly of bony and cartilaginous fishes. Since sixgill sharks do not appear to be abundant anywhere, their distribution and movement patterns along the deep coastal waters off California are, for the most part, unknown.

86-001584 Erdman, D. S. THE GREEN STREAM GOBY, *SICYDIUM PLUMIERI*, IN PUERTO RICO. *Trop. Fish Hobbyist* 34(6):70-74. 1986. FR 31(2)

The upstream periodic migration of juvenile gobies, *Sicydium plumieri* (Bloch, 1786), is related to the last quarter moon phase when the postlarvae appear along the sea shore as they approach the river mouth. They begin metamorphose into juveniles as soon as they reach fresh water. They change from a transparent planktivorous marine fish to a juvenile specialized herbivore and shrink in length during metamorphosis. Juveniles migrate upstream in a long column that can take as much as two days to pass a single point along the river. Juveniles respond to flooding river pulses by rhythmic tail thrashing and climb over cataracts that are inaccessible to native snails and other fishes. When swimming by a tributary stream, certain juveniles indicate homing instinct. Larger adults live in the head waters and presumably spawn among the rocks and boulders. Males in nuptial colors defend territories in summer in the fast flowing upland streams.

86-001585 Erokhin, V. G.; Y. I. Gavrenkov and K. A. Kashkin. BIOLOGY OF CHUM SALMON, *ONCORHYNCHUS KETA* FROM SOUTHERN PRIMORYE. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)* 25(3):44-49. 1985. FR 31(2)

[TINRO, Vladivostok, USSR]

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86-001587 Gunawardana, J. *ETROPLUS MACULATUS* (ORANGE CHROMIDE) SINHALA RALLIYA, KAHAKKARALIYA. *Loris* 17(1):9. 1985. FR 31(2)

[15A, Stanley Tilakaratna Mawatha, Nugegoda, Sri Lanka]

86-001588 Hall, G. E., (ed.). BIOLOGY AND MANAGEMENT OF THE MUSKELLUNGE. *A Fish. Soc.* 1985. A collection of papers. Available @ \$32.50 from American Fisheries Society, 5410 Grosvenor Lane, Suite 110, Bethesda, MD 20814-2199. 31(2)

A hardcover printing of research papers presented at the International Muskie Symposium at La Crosse, Wisconsin, April 4-6, 1984. An outstanding reference book on the Muskellunge biology and life history; community interactions; management; culture; catch and release; role of anglers; and future research needs.

86-001589 Lukmanov, E. G.; T. B. Nikiforova and V. P. Ponomarenko. DISTRIBUTION OF MENEK, *BROSME BROSME* (GADIDAE), IN WATERS OF THE NORWEGIAN AND BARENTS SEAS. *J. Ichthyol. (Engl. Transl. Vopr. Ikhtiol.)*

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86-001589 CONTINUED 25(3):133-139. 1985. FR 31(2)

[Polar Res. Inst. Mar. Fish. Oceanogr., Murmansk, USSR]

86-001590 Merrett, N. R. and L. Saldanha. ASPECTS OF THE MORPHOLOGY AND ECOLOGY OF SOME UNUSUAL DEEP-SEA EELS (SYNAPHOBANCHIDAE, DERICHTHYIDAE AND NETTASTOMATIDAE) FROM THE EASTERN NORTH ATLANTIC. *J. Fish Biol.* 27(6):719-747. 1985. FR 31(2)

[Inst. Oceanogr. Sci., NERC, Wormley, Godalming, Surrey, U.K.]

86-001591 Miller, R. DARTERS. *Outdoor Okla.* 42(2):42-45. 1986. FR 31(2)

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[Dep. Mar. Sci., Univ. South. Fla., 140 Seventh Ave. South, St. Petersburg, FL 33701]

86-001593 Prouzet, P. and J. Gaignon. [CHARACTERISTICS OF ONE SEA WINTER ATLANTIC SALMON STOCK CAUGHT ON ELORN RIVER FROM 1974 TO 1984.] *Rev. Trav. Inst. Peches Marit.* 47(3-4):167-178. 1985. In French with English summ. FR 31(2)

[IFREMER, Cent. Brest, DRV/AP, B.P. 337, 29273 Brest Cedex, France]

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[CSIRO Mar. Lab., P.O. Box 120, Cleveland, Qld. 4163, Australia]

86-001595 Ryon, M. G. THE LIFE HISTORY AND ECOLOGY OF *ETHEOSTOMA TRISELLA* (PISCES: PERCIDAE). *Am. Midl. Nat.* 115(1):73-86. 1986. FR 31(1)

[Chem. Hazard Eval. Prog., Oak Ridge Natl. Lab., Oak Ridge, TN 37831] The trispot darter *Etheostoma trisella* Bailey and Richards occurs only in the Conasauga River and its tributaries in northern Georgia and southeastern Tennessee. It requires two separate but interconnected habitats. When not breeding, *E. trisella* occupies the peripheral zones of the main river in areas of slow current, gravel-silt substrate, and aquatic vegetative or leaf litter cover. In the study area, the breeding habitat is a small clay-bottomed seepage stream with heavy aquatic vegetation and relatively warm water temperatures located in a marshy pasture 2.5 km from the main river. The principal food items in both habitats are Ephemeroptera nymphs and Chironomidae larvae, which account for 19% and 70%, respectively, of the items eaten annually. A relative biomass index indicates more equal contributions from both groups. Parasitism is minimal and predation is not evident. Trispot darters spawn from January to March. Males exhibit bright orange-red and green breeding colors and have tubercles on the anal fin rays. Fecundity estimates range from 56-154 mature eggs per female and up to 292 per female when developing eggs are included. The eggs hatch in 30 days at 12 C and larval development is rapid, reaching the juvenile stage in 41 days. First-year individuals grow to an average size of 36 mm SL. The darters live 2+ years and adults have a 1:1 sex ratio. The uncommon habitat association required for successful reproduction indicates that *E. trisella* is vulnerable to human impact and its threatened species designation is justified.

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[U.S. FWS, 6924 Tremont Rd., Dixon, CA 95620]

86-001597 Stauffer, G. D. BIOLOGY AND LIFE HISTORY OF THE COASTAL STOCK OF PACIFIC WHITING, *MERLUCCIIUS PRODUCTUS*. *Mar. Fish. Rev.* 47(2):2-7. 1985. FR 31(2)
[NMFS, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115]

86-001598 Thompson, K. W. DISTRIBUTION AND STATUS OF THE DARTERS OF THE UPPER LITTLE TALLAHATCHIE RIVER DRAINAGE. *J. Miss. Acad. Sci.* 30(Suppl.):80. 1985. Abstract only. FR 31(2)
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86-001599 Thomsen, K. S. MARGINALIA - A FISHY STORY. *Am. Sci.* 74(2):169-171. 1986. FR 31(2)
[Dep. Biol., Yale Univ., New Haven, CT]

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[Mar. Biol. Unit, Fawley Power Stn., Fawley, Southampton, Hampshire England]

86-001601 Yamashita, Y. and T. Aoyama. HATCHING TIME, YOLK SAK ABSORPTION ONSET OF FEEDING, AND EARLY GROWTH OF THE JAPANESE SAND EEL *AMMODYTES PERSONATUS*. *Bull. Jpn. Soc. Sci. Fish.* 51(11):1777-1780. 1985. FR 31(2)
[Ocean Res. Inst., Univ. Tokyo, Nakano, Tokyo 164, Japan]

POPULATION STUDIES, PRODUCTION, RECRUITMENT, ETC.

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[NMFS, 7600 Sand Point Way NE, Bin C15700, Seattle, WA 98115]

86-001603 Bart, H. L., Jr. STABILITY AND RESILIENCY OF FISH ASSEMBLAGES IN AN OZARK STREAM. *Ph.D. dissertation, Univ. Okla.* 57p. 1985. From Diss. Abstr. Int. B Sci. Eng. 46(8):2543. 1986. FR 31(2)

86-001604 Basimi, R. A. and D. J. Grove. STUDIES ON FEEDING, GROWTH AND PRODUCTION OF A RECRUITED INSHORE POPULATION OF *PLEURONECTES PLATESSA* (L.) AT EAST ANGLESEY, NORTH WALES. *J. Fish Biol.* 27(6):765-783. 1985. FR 31(2)
[Dep. Mar. Biol., Mar. Sci. Lab., Menai Bridge, Gwynedd, North Wales, U.K.]

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[Dep. Fish. Oceans, 4160 Marine Dr., West Vancouver, BC V7V 1N6, Canada] Some of the consequences of varying flows on the downstream migration of salmon fry were investigated in five replicate streams adjacent to the lower Waitaki River, New Zealand. Fluctuating discharge appeared to increase the number of fry moving downstream, provided that mean water velocities at peak flows exceeded 25 cms⁻¹ and that some fry weré migrating out of the streams anyway. Salmonids appear to have a lengthier flow-sensitive period than has been proposed in the literature. Research is required to determine whether recently emerged fry that leave parental spawning streams in New Zealand disperse immediately to the ocean or develop and grow for extended periods en route. It may sometimes be feasible and worthwhile to minimize stream flow variations to encourage fry to remain longer in fresh water.

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[Dep. Biol. Sci., Bowling Green State Univ., Bowling Green, OH 43403] Diets of white perch and white bass were compared to assess diet similarity and potential of competition between these two species. White perch, a recent colonizer of Lake Erie, has increased in abundance and may potentially effect native white bass population. Diets of both species were examined in Sheldons's Marsh and Old Woman Creek, two shallow, inshore areas in the central basin of Lake Erie. Fish were collected from April through October, 1983 using trap nets. Comparisons of diets were made using percent composition of prey taxa by number and biomass. Results of these analyses indicated that both species fed on fish, zooplankton, and benthos. Diets differed, however, in that fish prey comprised the major component of white bass diet whereas white perch fed more on zooplankton. Both species fed equally on benthos. These data suggest that white perch and white bass diets do overlap in these inshore areas and that these species may potentially interact.

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[Zool. Inst., Univ. Wien, Althanstr. 14, A-1090 Wien, Austria] Chars from seven Austrian lakes (three above the timber line, four in the Austrian lake district Salzkammergut) have been studied. The digestive tract filling

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FOODS/FEEDING (CONTINUED)

86-001683 CONTINUED in percent of body weight is higher among the dwarfed forms in high-mountain lakes than among better growing populations in lower-laying areas. This is an argument against the theory that dwarfed chars suffer starvation. In Mittlerer Plenderlesee, surface food predominates during the ice-free period; under the ice cover chars feed mainly on aquatic insect larvae. In Oberer Plenderlesee the (summer) food is similar. In Drachensee in summer, more chironomid pupae than surface food are taken up, in winter mainly aquatic insect larvae. In the lakes studied in Salzkammergut, chars tend to feed in summer nearly entirely on crustacean-plankton and chironomid pupae; in winter they take more benthic food. In Hallstättersee, however, they seem to be forced out of the plankton zone by coregonids. Fish are only rarely found in the digestive tract.

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[Dep. Civil Eng., Univ. Iowa, Iowa City] A small fraction of lakes sampled in the Upper Midwest are presently acidic (0% in northern Minnesota, 4% in northcentral Wisconsin, and about 19% in the eastern part of the Upper Peninsula of Michigan). Field data and analysis suggest that these lakes have been acidified by acid deposition for the following reasons: a) Acid lakes are found only where there is significant acid precipitation (pH<4.6) across the depositional gradient. b) Acid lakes are mainly (88%) seepage type lakes that receive most of their water from precipitation falling directly on the surface of the lake and have no permanent inlets or

POLLUTION (CONTINUED)

86-001868 CONTINUED outlets. c) Sulfate is the dominant anion in precipitation and in the chemistry of these lakes. d) Mass balance calculations at calibrated watersheds (Lake Clara and Lake Vandercook) indicate that more than 90% of hydrogen ions come directly from precipitation. The upper midwest is sensitive to future increases in acid deposition. At the precipitation pH found in the Adirondack Mountains of New York (ph 4.1), about 30% of the lakes would be acidified based on model predictions. The model described here is based on a mass balance for alkalinity in a lake. It was calibrated with field measurements, and the kinetic formulations were based on laboratory experiments reported in the literature on chemical weathering. The model can be used in a steady-state or a time-variable mode to yield the response to scenarios of increasing or decreasing acid deposition. It is a tool that may be used to estimate the lake resources at risk at various levels of acidic deposition.

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[Dep. Chem., Univ. Jyväskylä, Kyllikinkatu 13, SF-40100, Jyväskylä, Finland]

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86-001873 Thomsen, H. A. and O. Moestrup. IS *DISTEPHANUS SPECULUM* A FISH-KILLER? A REPORT ON AN UNUSUAL ALGAL BLOOM FROM DANISH COASTAL WATERS. *Bull. Mar. Sci.* 37(2):778. 1985. Abstract only. FR 31(2)

[Inst. Sporeplanter, Univ. Copenhagen, Ø. Farimagsgade 2D, DK-1353 Copenhagen K, Denmark]

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86-001874 CONTINUED 11(1):91-99. 1986. FR 31(2)

[Lab. Anim. Res. Cent., Rockefeller Univ., 1230 York Ave., New York, NY 10021]

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[Analyt. Chem., Univ. Coll. Castellon, Univ. Valencia, Apdo. 224, 12004 Castellon, Spain]

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86-001877 Belanger, S. E.; K. Schurr; D. J. Allen and A. F. Gohara. EFFECTS OF CHRYSOTILE ASBESTOS ON COHO SALMON AND GREEN SUNFISH: EVIDENCE OF BEHAVIORAL AND PATHOLOGICAL STRESS. *Environ. Res.* 39(1):74-85. 1986. FR 31(2)

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[Univ. Quebec, INRS-Eau, C.P. 7500, Sainte-Foy, PQ G1V 4C7, Canada]

86-001882 Chagnon, N. L. and I. Hlohowskyj. EFFECTS OF SUBLETHAL PHENOL EXPOSURE ON THE TEMPERATURE TOLERANCE AND LOW OXYGEN TOLERANCE OF STONEROLLER MINNOWS, *CAMPOSTOMA ANOMALUM*. *Ohio J. Sci.* 86(2):54. 1986. Abstract only. FR 31(2)

[Dep. Zool., Miami Univ., Oxford, OH 45056] Stoneroller minnows, *Campostoma anomalum*, were exposed to four sublethal concentrations of phenol (6, 8, 10, and 12 ppm) for 48 hours, and the effects of these concentrations on temperature tolerance (CTMax) and low dissolved oxygen tolerance were observed. The mean CTMax values of fish exposed to 6 and 8 ppm

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TOXICOLOGY; BIOASSAYS (CONTINUED)

86-001882 CONTINUED phenol (35.6 and 35.3 C, respectively) did not differ from the mean CTMax recorded for control fish (35.8 C). Although fish exposed to ppm phenol exhibited loss of equilibrium at a lower mean dissolved oxygen concentration ($1.5 \text{ mg O}_2 \cdot \text{l}^{-1}$) than the control group ($1.9 \text{ mg O}_2 \cdot \text{l}^{-1}$), the values were not significantly different. Fish exposed to 6 ppm phenol had significantly greater ($P < 0.05$) mean oxygen tolerance ($1.3 \text{ mg O}_2 \cdot \text{l}^{-1}$) than the control group. Exposure to 10 ppm phenol significantly depressed temperature tolerance (34.7C but did not affect low oxygen tolerance ($1.9 \text{ mg O}_2 \cdot \text{l}^{-1}$). The results of the present study suggest that stoneroller minnows may become more sensitive to increased temperature and decreased dissolved oxygen concentrations following exposure to sublethal concentrations.

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[Dep. Biol., McMaster Univ., Hamilton, ON L8S 4K1, Canada]

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[T.W. Moon: Dep. Biol., Univ. Ottawa, Ottawa, ON K1N 6N5, Canada]

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[Inst. Natl. Rech. Agron., B.P. 3, 31931 Toulouse Cedex, France]

86-001889 Cravedi, J. P. and J. Tulliez. METABOLISM OF *n*-ALKANES AND THEIR INCORPORATION INTO LIPIDS IN THE RAINBOW TROUT. *Environ. Res.* 39(1):180-186. 1986. FR 31(2)

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[Inland Fish. Coll., 127 Davey St., Hobart, Tasmania, Australia 7000]

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[Dep. Biochem., Royal Holloway Coll., Univ. London, Egham, Surrey TW20 OEX England]

86-001897 Eisler, R. CHROMIUM HAZARDS TO FISH, WILDLIFE, AND INVERTEBRATES: A SYNOPTIC REVIEW. *U.S. Fish Wildl. Serv. Biol. Rep.* 85(1.6):viii + 60p. 1986. FR 31(2)

[Patuxent Wildl. Res. Cent., U.S. FWS, Laurel, MD 20708]

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[N.E.R.C. Inst. Mar. Biochem., St. Fitticks Rd., Aberdeen AB1 3RA, Scotland]

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86-001902 Hamelink, J. L.; D. R. Buckler; F. L. Mayer; D. U. Palawski and O. Sanders. TOXICITY OF FLURIDONE TO AQUATIC INVERTEBRATES AND FISH. *Environ. Toxicol. Chem.* 5(1):87-94. 1986. FR 31(2)

[Lilly Res. Lab., Greenfield, IN 46140] The acute and chronic toxicities of the herbicide fluridone to aquatic invertebrates and fish were evaluated. The acute median lethal concentrations (LC50s) of fluridone were 4.3 ± 3.7 mg/L (x \pm SD) for invertebrates (n=15) and 10.4 ± 3.9 mg/L for fish (n=28). In chronic studies, no effects were detected when daphnids (*Daphnia magna*) were continuously exposed to fluridone concentrations of 0.2 mg/L or less for 30 d. Amphipods (*Gammarus pseudolimnaeus*) to 0.6 mg/L or less for 60 d or minnow larvae (*Chironomus plumosus*) to 0.6 mg/L or less for 30 d. Fathead minnow (*Pimephales promelas*) were not affected by continuous exposure to fluridone concentrations of 0.48 mg/L or less over their life cycle. The growth and survival of channel catfish (*Ictalurus punctatus*) were not adversely affected by continuous exposure to fluridone concentrations of 0.5 mg/L or less for 60 d after hatching. The channel catfish accumulated fluridone concentrations up to nine times greater than that in water. The recommended application rate of 0.5 lb/acre of fluridone to a pond with an average depth of 3 ft provides a theoretical concentration of 0.1 mg/L. Thus, an initial fluridone concentration of 0.1 mg/L or less is recommended to control weeds in ponds. Consequently, fluridone is not expected to have adverse effects on the species tested or on similar nontarget aquatic organisms.

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[U.S. EPA, Sabine Island, Gulf Breeze, FL 32561]

86-001904 Haux, C.; Å. Larsson; G. Lithner and M. Sjöbeck. A FIELD STUDY OF THE PHYSIOLOGICAL EFFECTS ON FISH IN LEAD-CONTAMINATED LAKES. *Environ. Toxicol. Chem.* 5(3):283-288. 1986. FR 31(2)

[Dep. Zoophysiol., Univ. Göteborg, S-400 31 Göteborg, Sweden]

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[Dep. Biol., Univ. Waterloo, Waterloo, ON N2L 3G1, Canada]

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[B. Korsgaard: Inst. Biol., Odense Univ., Campusveg 55, DK-5230 Odense M, Denmark]

86-001909 Karlsson-Norrgren, L.; W. Dickson; O. Ljungberg and P. Runn. ACID WATER AND ALUMINIUM EXPOSURE: GILL LESIONS AND ALUMINIUM ACCUMULATION IN FARMED BROWN TROUT, *SALMO TRUTTA* L. *J. Fish Dis.* 9(1):1-9. 1986. FR 31(2)

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[Dep. Fish Oceans, Freshwater Inst., Winnipeg, MB R3T 2N6, Canada]

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[Ont. Minist. Environ., Aquatic Toxicol. Unit, P.O. Box 213, Rexdale, ON M9W 5L1, Canada]

86-001913 Nimi, A. J. and B. G. Oliver. BIOLOGICAL HALF-LIVES OF CHLORINATED DIBENZO-*p*-DIOXINS AND DIBENZOFURANS IN RAINBOW TROUT (*SALMO GAIIRDNERI*). *Environ. Toxicol. Chem.* 5(1):49-53. 1986. FR 31(2)

[Great Lakes Fish. Res. Br., Can. Cent. Inland Waters, Burlington, ON L7R 4A6, Canada] The biological half-lives of five dibenzo-*p*-dioxins and two dibenzofurans were determined in rainbow trout following a single oral exposure. Estimated half-lives ranged from 2 d for 2, 7-dichlorodibenzo-*p*-dioxin to 43 d for 1, 2, 3, 4-tetrachlorodibenzo-*p*-dioxin among the dioxins, and from 12 d for octachlorodibenzofuran to 24 d for 3, 6-dichlorodibenzofuran. No consistent relationship was shown between half-life and the degree of chlorination. Absorption efficiencies varied from 2 to greater than 30%, although most values ranged from 5 to 16%.

86-001914 Oikari, A. O. J. METABOLITES OF XENOBIOTICS IN THE BILE OF FISH IN WATERWAYS POLLUTED BY PULPMILL EFFLUENTS. *Bull. Environ. Contam. Toxicol.* 36(3):429-436. 1986. FR 31(2)

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86-001915 Orr, P. L.; R. W. Bradley; J. B. Sprague and N. J. Hutchinson. ACCLIMATION-INDUCED CHANGE IN TOXICITY OF ALUMINUM TO RAINBOW TROUT (*SALMO GAIIRDNERI*). *Can. J. Fish. Aquatic Sci.* 43(1):243-246. 1986. FR 31(2)

[1471 Seagram Ave., Oakville, ON L6L 1W9, Canada]

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[Tidal Rush Mar. Lab., Box 263 Madeira Park, BC V0H 2H0, Canada]

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[NMFS, 2725 Montlake Blvd. East, Seattle, WA 98112]

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86-001925 Torres, P.; L. Tort; J. Planas and R. Flos. EFFECTS OF CONFINEMENT STRESS AND ADDITIONAL ZINC TREATMENT ON SOME BLOOD PARAMETERS IN THE DOGFISH *SCYLIORHINUS CANICULA*. *Comp. Biochem. Physiol. C Comp. Pharmacol. Toxicol.* 83(1):89-92. 1986. FR 31(2)

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[KIWA Ltd., Res. Dep., P.O. Box 1072, 3430 BB Nieuwegein, Netherlands] A step forward has been set towards the realization of a reliable "sister-chromatid" exchange (SCE) assay with fish for the detection of mutagens in water. This test can detect mutagenic contaminants in water without prior concentration steps. A healthy breeding stock of the tropical fish *Nothobranchius rachowi* has been set up in our laboratory. This fish is particularly suited for the SCE assay because of its low number of chromosomes. The major improvement consisted of the development of a reliable staining technique for the differentiation of sister-chromatids. The assay can now be used for research purposes. With a few improvements it can become a rapid low-cost test for the screening of effluents on contamination with DNA-damaging agents.

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In 1979 and 1980 the Fisheries Research Section conducted a 2-year study. Little Emerald Lake and Emerald Lake, collectively called Emerald Lake, the third largest natural lake in Colorado, supports a self-sustaining hybrid rainbow-cutthroat trout population originating from the introduction of these two species in the late 1880's. Inlet and outlet spawning habitats, which sustain this trout population, were delineated. In 1980 the inlet stream contained 581 m² of reproductive habitat; the outlet stream contained 805 m² of spawning habitat and 695 m² of reproductive habitat. In 1980 there were 2,985 (±372) adults in the outlet spawning run and 2,357 (±233) adults in the inlet spawning run. Age and growth calculations were based on 9 scales collected from trout at the inlet and outlet weir sites and gillnetting Emerald Lakes. Age groups III, IV, and V made up 93% of the outlet and 83% of the inlet spawning runs. The difference in summer water temperature between inlet and outlet spawning counts, to distinguish between inlet- and outlet-origin spawning sites. As a result it was estimated that 62% of the adults sampled in the Emerald Lakes system had circuli counts that identified them as originating from outlet spawning sites. Creel survey data indicated a

86-001992 CONTINUED average of 888 anglers fished 2,448 hours (20.4 hrs/ha) and harvested 1,114 trout from Emerald Lakes in 1979 and 1980. The average length of trout creel in 1979 and 1980 was 279 and 298 mm (11.0 and 11.7 inches), respectively. Artificial spawn-taking operations conducted at Emerald Lakes resulted in the introduction of Emerald rainbow into eight additional Colorado waters.

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